

IN THE CLAIMS

Claim 1 (original). A process for preparing a polyacrylate having an at least bimodal molecular weight distribution, characterized in that a monomer mixture which comprises

- a1) acrylic acid and/or acrylic esters of the formula $\text{CH}_2=\text{C}(\text{R}')(\text{COOR}^2)$, where $\text{R}' = \text{H}$ or CH_3 and R^2 is an alkyl chain having 1 to 20 carbon atoms, at 70%-100% by weight, based on the polymer,
- a2) olefinically unsaturated monomers containing functional groups, at 0-30% by weight, based on the polymer,

is polymerized in an at least two-phase free-radical polymerization to give a polyacrylate having a broad, at least bimodal molecular weight distribution, polymerization taking place in a first phase of the at least two-phase polymerization, by means of a low initiator concentration relative to the monomer, to give a first polymer having a molecular weight which is high on average, and, before the monomer mixture has been completely consumed by reaction, a next phase of polymerization is started, by the addition at least once of a regulator, and in this further phase or further phases a further polymer is synthesized having a molecular weight which is relatively low on average.

Claim 2 (currently amended). The process of claim 1, ~~characterized in that~~
wherein the at least two-phase free-radical polymerization is taken to a total conversion of all phases of greater than 97%.

Claim 3 (currently amended). The process of claim 1 ~~or 2, characterized in that~~
wherein the polymerization is carried out in two phases and a bimodal molecular weight distribution is built up, the molecular weight maxima in the molecular weight distributions of the two polymers being **preferably** at least 50 000 g/mol apart.

Claim 4 (currently amended). The process of ~~any one of claims 1 to 3, characterized in that claim 1, wherein~~ the polydispersity of the polymers is greater than 6.

Claim 5 (currently amended). The process of ~~any one of claims 1 to 4, characterized in that claim 1, wherein~~ the molar ratio of monomer mixture to initiator is less than 0.005, ~~preferably less than 0.003.~~

Claim 6 (currently amended). The process of ~~any one of claims 1 to 5, characterized in that claim 1, wherein~~ the addition of initiator takes place in two or more steps.

Claim 7 (currently amended). The process of ~~any one of claims 1 to 6, characterized in that claim 1, wherein said at least one regulator is selected from the group consisting of~~ alcohols, ethers, dithioethers, dithiocarbonates, trithiocarbonates, nitroxides, alkyl bromides, thiols, TEMPO ~~or and~~ TEMPO derivatives ~~are used as regulators.~~

Claim 8 (currently amended). The process of ~~any one of claims 1 to 7, characterized in that claim 1, wherein~~ the regulator is added no earlier than after one hour's polymerization time but no later than two hours before the end of polymerization.

Claim 9 (currently amended). A polyacrylate as ~~obtainable obtained by the process of claim 1, according to any one of claims 1 to 8, characterized in that it comprises comprising~~ the following monomer units:

- a1) acrylic acid and/or acrylic esters of the formula $\text{CH}_2=\text{C}(\text{R}')(\text{COOR}^2)$, where R' = H or CH_3 and R^2 is a linear, branched or cyclic alkyl chain having 1 to 20 carbon atoms,
at 70%-100% by weight, based on the polymer,
- a2) olefinically unsaturated monomers containing functional groups,

at 0-30% by weight, based on the polymer,
and ~~in that it has having~~ a broad, at least bimodal molecular weight distribution,
the molecular weight maxima in the molecular weight distributions of at least two
polymers being ~~preferably~~ at least 50 000 g/mol apart.

Claim 10 (currently amended). The polyacrylate of claim 9, ~~characterized in that~~
~~wherein~~ the olefinically unsaturated monomers containing functional groups are
selected from the ~~following group consisting of vinyl compounds containing~~
~~functional groups:~~ maleic anhydride, vinyl acetate, acrylamides, and double-
bond-functionalized photoinitiators containing functional groups.

Claim 11 (currently amended). The polyacrylate of claim 9 ~~or 10, characterized in~~
~~that it further comprises further comprising~~ crosslinkers, photoinitiators,
resins ~~customary for polyacrylates~~, plasticizers, fillers, expandants,
compounding agents and/or aging inhibitors.

Claim 12 (currently amended).. ~~The use of the polyacrylate of any one of the~~
~~preceding claims as a~~ A pressure-sensitive adhesive comprising the
polyacrylate of claim 9.

Claim 13 (currently amended). ~~The use of claim 12 for an~~ An adhesive tape
comprising the pressure-sensitive adhesive of claim 12, the acrylate
pressure-sensitive adhesive being present as a single-sided or double-
sided film on a on one or both sides of a carrier film.